



GW Insteek GDS1000A-U and RIGOL DS1000E VS. TBS1000 and TDS2000C Competitive Brief

The Value to Customers

GW Insteek launched the GDS1000A-U series in July 2011 and Rigol launched the DS1000E series in 2008. These products are aimed at low end oscilloscope customers typically found in the education, basic manufacturing and small business market segments where price is very important. Based on pricing, these products have been especially popular with education customers in the developing countries like China, Brazil and India. The TBS1000 and TDS2000C series oscilloscopes are the Tektronix instruments that most often compete with these products.

This brief provides information regarding limitations of the GDS1000A-U and Rigol DS1000E series that many customers may not know.

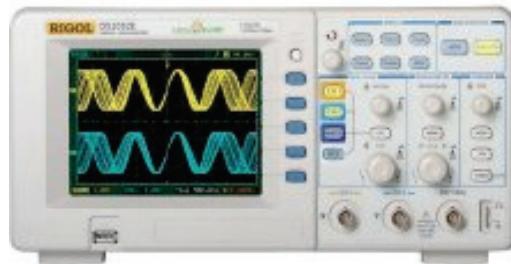
Competitors' advertised specs and features

GDS1000A-U



- 150/100/70MHz Bandwidths, 2 channels
- 1GSa/s Real-Time Sample Rates Maximum, 25GSa/s Equivalent-Time
- 2Mega Points Record Length
- Up to 27 Automatic Measurements
- 5.7" TFT LCD Display
- USB Host and Device Interface Supported
- Go/NoGo Function
- Data Logger
- Limited Lifetime Warranty

DS1000E



- 50/100MHz Bandwidths, 2 analog channels
- 1GSa/s maximum real-time sample rate and 25GSa/s equivalent time sample rate
- 5.6" TFT-LCD QVGA (320X240) with 64K color LED backlit display
- Trigger modes: edge, pulse width, slope, video, alternate trigger
- Multiple interface configurations: Standard USB Host and USB device supporting flash drive storage, and PictBridge print standards, RS-232 and optional USB-GPIB adapter

Sample Rate

- Both GDS1000A-U and DS1000E claim to have a real-time sampling rate of 1GS/s maximum. But this sample rate is only available when only one channel is on. With two channels turned on, the oscilloscope is limited to 500MS/s real time sample rate. If users attempt to use sweep speeds that are faster than the sample rate can accommodate the instrument automatically changes to equivalent time (ET) mode - with no way to turn it off, potentially misleading customers about the accuracy of their measurements.
- The Tektronix TBS1000 and TDS2000C series offers 2- and 4-channel (available on TDS2000C only) models, with no compromises to sample rate. Regardless of the number of channels used the maximum sample rate will always be available for all channels.

Limited Lifetime Warranty

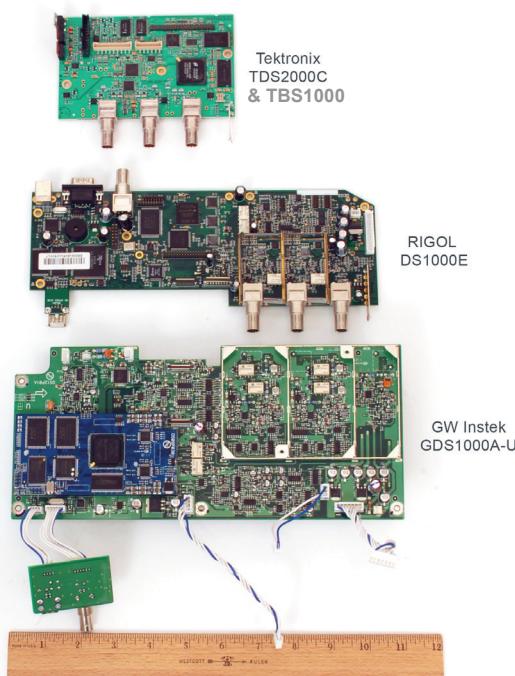
- Tektronix reinforces a commitment to excellence with a 5-year warranty on all TBS1000 models and lifetime warranty on all TDS2000C models.
- Rigol only offers 3 years warranty on the DS1000E.
- GW Insteek is trying to compete with our products by offering "Limited Lifetime warranty". However, in their "Lifetime Warranty", **the LCD display, which is the one of the most expensive and fragile components, is only warranted for 1 year**. The warranty is terminated at a period ending five (5) years after GW Insteek discontinues manufacturing the warranted products. This means that if a purchase is made within 1-2 years of the end of life the warranty is only 6-7 years. The warranty can be as short as only 5 years if the product is purchased close to the end of the product's life cycle.
- The TDS2000C warranty period is guaranteed to be **at least** ten (10) years from the date of purchase.
- Both the GDS1000A-U and DS1000E use a fan as part of the cooling design. As a moving part, a cooling fan is not reliable for long term usage.

This is a major customer benefit. Owning a TBS1000 or TDS2000C with a more complete warranty can reduce the cost of ownership and provide benefits for a longer period of time.

Board design

Tektronix has been making oscilloscopes for over 65 years and has developed market leading technology that enables us to manufacture highly reliable products that save cost and energy. The pictures below showing the main boards of TBS1000 and TDS2000C, DS1000E and GDS1000A-U demonstrate the differences in design sophistication.

The TDS board has a high level of integration which uses custom ASICs designed specifically for this class of instruments. This results in an instrument that has fewer parts, lower power consumption, and higher MTBF figures.



- Both the GDS1000A-U and DS1000E have more complicated board designs based on commercial components, making the boards more than 2 times larger with 4 to 7 times more components implying lower reliability when compared to the TBS1000 and TDS2000C.
- GDS1000A-U and DS1000E both have fans which are components known to have very low reliability figures. The need for a fan also indicates more power dissipation, and thus more heat on the boards. Heat can reduce the board's reliability.
- GDS1000A-U and DS1000E also use relays which are low reliability components and can further reduce the overall reliability of the instrument.

Ask your customer; 'Would you rather have an instrument with a Lifetime warranty and a design built for reliability or an instrument with a limited warranty and a design that uses less reliable parts?'

Tektronix' Most Popular Oscilloscopes

- The first generation TDS series launched 15 years ago, and quickly became popular with customers because of its performance and value. More than 1 million TDS series have been sold worldwide and many of the first generation models are still working in labs. Tektronix provides customers with the peace of mind that

the instrument will continue to support their design projects for years to come and that it is backed by the Tektronix lifetime warranty.

- The TBS1000 and TDS2000C are 3rd generation products and continues to bring the highest quality, lowest cost of ownership and best long term value to our customers.
- For education customers, your students can learn to operate one of the world's most popular oscilloscope platforms. Preparing them for future careers where they will see Tektronix oscilloscopes in the workplace.

Environmental

	Tektronix	GW Insteck	RIGOL
	<ul style="list-style-type: none"> TBS1000 TDS2000C 	<ul style="list-style-type: none"> GDS1000A-U 	<ul style="list-style-type: none"> DS1000E
▪ Operating Temperature	▪ 0 to +50 °C	▪ 0 to 50 °C	▪ 10 to 40 °C
▪ Non-operating Temperature	▪ -40 to +71 °C	▪ -10 to +60 °C	▪ -20 to +60 °C
▪ Altitude	▪ Up to 3000m	▪ <2000m	▪ Up to 3000m

GW Insteck doesn't provide any environmental information in their datasheet (only provided in user manual). The customer may be surprised about the operating limitations after they purchase the instrument.

If your customers are likely to use oscilloscopes in extreme weather or high altitude, bring up the environmental data differences. TEK scopes are more reliable in these extreme environments

Summary:

Emphasize Tektronix' quality and overall long term value to customers.

- The TBS1000 and TDS2000C series are Tektronix' 3rd generation products and they continue to deliver the highest quality, lowest cost of ownership and best long term value to customers.
- Tektronix TBS1000 and TDS2000C provide 2-channel and 4-channel (available on TDS2000C only) models, with no compromises to sample rate. By comparison, the GDS1000A-U and DS1000E 1 GS/s maximum sample rate is only available when only one channel is on. With two channels turned on, the oscilloscope is limited to 500MS/s real time sample rate. Under certain conditions the instrument will change modes from Real-time to Equivalent-time, if you don't know when it changes; you may have difficulty getting the data you need.

- Tektronix reinforces a commitment to excellence with a lifetime warranty on The TDS2000C and 5-year warranty on the TBS1000. For the GW Insteck product the LCD display is only warranted for 1 year. The Lifetime Warranty can be as short as only 5+ years due to the "fine print" in the warranty about product end of life. Owning a TBS1000 or TDS2000C will save money on maintenance, making the cost of ownership lower than any other competitive scope.
- Although imitated by competitors, the technology and quality of Tektronix instruments are not easily duplicated. Tektronix has a more sophisticated board design which is less than half the size of the GDS1000A-U and DS1000E boards. The more complicated board design of the competitors will inevitably result in a less reliable product, which

can reduce efficiency and increase cost of ownership.

- When choosing Tektronix, customers are selecting the world's bestselling scope. Tektronix provides

them with the peace of mind by giving them the highest quality products with lower cost of ownership and the best long term value.

Comparison Chart: TDS2000C vs. GDS1000A-U and DS1000E

Feature	TBS1000	TDS2000C	GDS1000A-U	DS1000E
Bandwidth	25MHz, 40MHz, 60MHz 100MHz, 150MHz	50MHz, 70MHz, 100MHz, 200MHz	70MHz, 100MHz, 150MHz	50MHz, 100MHz
Sample Rate	Up to 2 GSa/s on all channels	Up to 2 GSa/s on all channels	1GSa/s 1 channel 500MSa/s 2 Channels 25GSa/s Equivalent-Time	1GSa/s 1 channel 500MSa/s 2 Channel 25GSa/s Equivalent-Time
Record Length	2.5k All Channel ¹	2.5k All Channel ¹	2M 1 Channel 1M 2 Channels	1Mk 1 Channel 500K 2 Channels
Trigger	Edge, Pulse Width (Glitch), Video	Edge, Pulse Width (Glitch), Video	Edge, Pulse Width, Video	Edge, Pulse Width, Video, Slope, Alternate
Cooling Fan	No	No	Yes	Yes
Connectivity	USB Host & Device Optional: GPIB	USB Host & Device Optional: GPIB	USB Host & Device	USB Host & Device, RS232
Print	PictBridge	PictBridge	PictBridge	PictBridge
Mask Test	Yes	Yes	Yes	Yes
Warranty	5-year Warranty	Lifetime Warranty	Lifetime Warranty Only 1 Year on LCD Display	3 Years
Price	Very Low	Low	Very Low	Very Low
Weight	2.0kg	2.0kg	2.5kg	2.3kg

¹ For the TDS/TBS oscilloscope, the feature that does not compare very well is the memory. The 2.5k point limit is much less than the 1M/2M points offered on the competitive products. This limitation is based on our chips that provide the best in class sample rate at the cost of memory depth. There are cases where this limitation is important, but we have found that often the longer memory depth is not used especially in teaching labs and in basic troubleshooting environments.